

This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a **Minor, Municipal** permit. The discharge results from the operation of a 0.16 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language, as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1. Facility Name and Mailing Address: Hamilton STP  
P.O. Box 130  
Hamilton, VA 20159  
SIC Code : 4952 (WWTP)  
  
Facility Location: 104 North Rogers Street  
Hamilton, VA 20159  
County: Loudoun  
  
Facility Contact Name: Greg K. Wilmoth, Mayor  
Telephone Number: (540) 338-2811
2. Permit No.: VA0020974  
Expiration Date of previous permit: November 29, 2010  
  
Other VPDES Permits associated with this facility: N/A  
Other Permits associated with this facility: N/A  
E2/E3/E4 Status: N/A
3. Owner Name: Town of Hamilton  
Owner Contact/Title: Greg K. Wilmoth / Mayor  
Telephone Number: (540) 338-2811
4. Application Complete Date: July 16, 2010  
Permit Drafted By: Susan Mackert  
Date Drafted: February 16, 2011  
Permit Drafted By: Susan Mackert  
Date Drafted: March 25, 2011  
Draft Permit Reviewed By: Alison Thompson  
Date Reviewed: March 1, 2011  
Draft Permit Reviewed By: Alison Thompson  
Date Reviewed: March 30, 2011  
WPM Review By: Bryant Thomas  
Date Reviewed: May 16, 2011  
Public Comment Period : Start Date: August 18, 2011  
End Date: September 16, 2011
5. Receiving Waters Information:  
  
Receiving Stream Name : UT, South Fork Catoctin Creek  
Stream Code: 1aXBL  
Drainage Area at Outfall: 1.75 Square Miles  
River Mile: 1.7  
Stream Basin: Potomac River  
Subbasin: Potomac River  
Section: 10b  
Stream Class: III  
Special Standards: None  
Waterbody ID: VAN-A02R  
7Q10 Low Flow: 0 MGD  
7Q10 High Flow: 0 MGD  
1Q10 Low Flow: 0 MGD  
1Q10 High Flow: 0 MGD  
Harmonic Mean Flow: 0 MGD  
30Q5 Flow: 0 MGD  
303(d) Listed: Receiving Stream - No  
30Q10 Flow: 0 MGD  
303(d) Listed: Downstream – Yes (bacteria)  
TMDL Approved: Receiving Stream - No  
Date TMDL Approved: N/A  
TMDL Approved: Downstream – Yes (bacteria)  
Date TMDL Approved: May 31, 2002 (*E. coli*)

It is staff's best professional judgement that based on a drainage area of 5 square miles or less, critical flows will be equal to 0.

## 6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

<input checked="" type="checkbox"/> State Water Control Law	<input type="checkbox"/> EPA Guidelines
<input checked="" type="checkbox"/> Clean Water Act	<input checked="" type="checkbox"/> Water Quality Standards
<input checked="" type="checkbox"/> VPDES Permit Regulation	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> EPA NPDES Regulation	

## 7. Licensed Operator Requirements: Class III

## 8. Reliability Class: Class II (See Section 27 of the Fact Sheet for further discussion)

## 9. Permit Characterization:

<input type="checkbox"/> Private	<input type="checkbox"/> Effluent Limited	<input type="checkbox"/> Possible Interstate Effect
<input type="checkbox"/> Federal	<input checked="" type="checkbox"/> Water Quality Limited	<input type="checkbox"/> Compliance Schedule Required
<input type="checkbox"/> State	<input type="checkbox"/> Toxics Monitoring Program Required	<input type="checkbox"/> Interim Limits in Permit
<input checked="" type="checkbox"/> POTW	<input type="checkbox"/> Pretreatment Program Required	<input type="checkbox"/> Interim Limits in Other Document
<input checked="" type="checkbox"/> TMDL		

## 10. Wastewater Sources and Treatment Description:

The Town of Hamilton STP is a secondary treatment facility. The STP is fed by three pump stations as well as gravity lines. Wastewater enters the headworks through a grit chamber and comminutor. Flow is then split between three aeration basins. Flow from the aeration basins is then routed to one of two secondary clarifiers which can each treat 0.08 MGD. Aeration basin number one directly enters one of two secondary clarifiers while aeration basin number two enters an additional aeration basin before entering secondary clarification.

After clarification, flow is then directed to the ultraviolet (UV) disinfection unit. The UV facility consists of four banks operated in series with each bank containing three lamps per bank. Flow then is directed to post aeration.

The facility received a Certificate to Operate for the Chemical Handling and Equipment Project on May 19, 2009. The chemical handling and treatment facility was completed as part of the Copper Study and Control Plan which was developed to address the exceedance of effluent limits for Total Copper. See Part 27 of the Fact Sheet for additional information.

Final effluent is then discharged via Outfall 001 to an unnamed tributary to South Fork Catoctin Creek.

See Attachment 1 for a facility schematic/diagram.

In August 2010, the town of Hamilton notified DEQ staff of potential problems with the integrity of effluent data reported on DMRs, sample collection, and operation and maintenance of the STP. The matter has been referred to compliance and enforcement for further review and action.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Domestic Wastewater	See Item 10 above.	0.16 MGD	39° 08' 20" N 77° 39' 47" W
See Attachment 2 for (Purcellville Quad, DEQ #215B) topographic map.				

**11. Sludge Treatment and Disposal Methods:**

Solids from the secondary clarifiers are wasted to the aerobic digester. After digestion, the solids are dewatered through a belt press. The pressed solids are hauled to the Loudoun County Landfill for final disposal. The application indicates that 50.9 dry metric tons are hauled to the landfill each year.

**12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge :**

TABLE 2 The facilities and monitoring stations listed below either discharge to or are located within the following waterbody: VAN-A02R	
1aSCO001.66	DEQ ambient and sediment monitoring station located on South Fork Catoctin Creek at the Route 698 bridge crossing.
1aS0C005.46	DEQ monitoring station located on South Fork Catoctin Creek at the Route 9 bridge crossing (Charles Town Pike).
1aS0C007.06	DEQ monitoring station located on South Fork Catoctin Creek at the Route 738 bridge crossing (Hampton Road).
VA0060500	Waterford Sewage Treatment Plant (South Fork Catoctin Creek)
VA0089940	Purcellville Town Water Treatment Plant (UT, South Fork Catoctin Creek)
VAG110121	Virginia Concrete Company, Inc. - Purcellville (South Fork Catoctin Creek)
VAG406086	Steven D. Smith Residence (North Fork Catoctin Creek)
VAG406106	Neersville Volunteer Fire and Rescue (Piney Run)
VAG406118	Christopher R. White Residence (South Fork Catoctin Creek)
VAG406168	Ginger Moore Residence (UT, South Fork Catoctin Creek)
VAG406477	Common Ground (UT, North Fork Catoctin Creek)

**13. Material Storage:**

TABLE 3 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Caustic	4 – 55 gallon barrels (with one in service)	Spill Containment
Metal Precipitate	3 – 55 gallon barrels (with one in service)	Spill Containment

**14. Site Inspection:** Performed by Susan Mackert and Stephanie Bellotti on November 1, 2010. The site visit confirms that the application packages received on May 18, 2010, and September 27, 2010, are accurate and representative of actual site conditions. The site visit memo can be found as Attachment 3.

**15. Receiving Stream Water Quality and Water Quality Standards:****a) Ambient Water Quality Data**

The nearest Department of Environmental Quality ambient monitoring station, 1aSOC001.66, is located in assessment unit VAN-A02R\_SOC01A00 approximately 5.9 miles downstream from the outfall location on South Fork Catoctin Creek at the Route 698 bridge crossing. This segment begins at the confluence with an unnamed tributary to South Fork Catoctin Creek, approximately 0.55 rivermiles upstream from Route 9, and continues downstream until the confluence with Catoctin Creek. The receiving stream, an unnamed tributary to South Fork Catoctin Creek, is not listed on the current 303(d) list.

The 2010 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report (IR) gives an impaired classification for the following downstream locations:

- Recreation Use Impairment

South Fork Catoctin Creek: Sufficient excursions from the maximum *E. coli* bacteria criterion (6 of 21 samples – 28.6%) were recorded at DEQ's ambient water quality monitoring station (1aSOC001.66) at the Route 698 crossing to assess this stream segment as not supporting of the recreation use goal for the 2010 water quality assessment.

The following Total Maximum Daily Loads (TMDLs) have been established.

- South Fork Catoctin Creek Recreation Use - Approved by EPA 5/31/02

The unnamed tributary to South Fork Catoctin Creek was not specifically included in the bacteria TMDL, however all upstream discharges were taken into account during TMDL development. As such, the facility received a WLA for *E. coli* of 2.78E+11 cfu/year.

The complete planning statement is located within the permit reissuance file.

**b) Receiving Stream Water Quality Criteria**

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, UT, South Fork Catoctin Creek, is located within Section 10b of the Potomac River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 4a details other water quality criteria applicable to the receiving stream.

**Ammonia:**

The fresh water, aquatic life Water Quality Criteria for Ammonia are dependent on the instream temperature and pH. When instream data are unavailable or when the receiving stream critical flows are zero, effluent pH and temperature are evaluated. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream. Because of recent data quality questions (as described in Section 10 of the Fact Sheet), previously established pH and temperature values will be carried forward as part of this reissuance.

The ammonia criteria for this reissuance (Attachment 4a) do not differ from those criteria established with the 2005 reissuance (Attachment 4b). The calculated criteria for both reissuances are 42 mg/L acute and 3.6 mg/L chronic.

As with the 2005 reissuance, the 2011 recalculated criteria are less stringent than what was previously determined during the 2000 permit reissuance (Attachment 4c). Therefore, the existing effluent limits shall be carried forward based on the previously determined criteria to ensure adequate protection. Although the new criteria would support relaxed effluent limits, staff has no basis to allow backsliding.

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). The 7Q10 of the receiving stream is zero, no ambient data is available, and there is no current hardness data for this facility. As such, the previously derived hardness value will be carried forward with this reissuance. The hardness-dependent metals criteria in Attachment 4a are based on an average effluent value of 109 mg/L.

Bacteria Criteria: The Virginia Water Quality Standards (9VAC25-260-170 A.) states that the following criteria shall apply to protect primary recreational uses in surface waters:

- 1) *E. coli* bacteria per 100 mL of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean <sup>1</sup>
Freshwater <i>E. coli</i> (N/100 ml)	126

<sup>1</sup>For a minimum of four weekly samples [taken during any calendar month]

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, UT, South Fork Catoctin Creek, is located within Section 10b of the Potomac River Basin. This section has not been designated with any special standards.

d) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on September 10, 2010, for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Wood Turtle, Upland Sandpiper, Loggerhead Shrike, Henslow's Sparrow, Bald Eagle, Green Floater, and Migrant Loggerhead Shrike. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and therefore, protect the threatened and endangered species found near the discharge.

**16. Antidegradation (9VAC25-260-30):**

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on the stream having a 7Q10 and 1Q10 of zero. At times, the stream is comprised entirely of effluent. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

**17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:**

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:

Because of recent data quality questions (as described in Section 10 of the Fact Sheet), effluent data obtained from daily operator logs and DMR submissions from 2009 through September 2010 has been determined to not be suitable for evaluation.

The following pollutants required a wasteload allocation analysis during the previous reissuance: Ammonia and Chlorine.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f)(Q_s)] - [(C_s)(f)(Q_s)]}{Q_e}$$

Where:	WLA	=	Wasteload allocation
	C <sub>o</sub>	=	In-stream water quality criteria
	Q <sub>e</sub>	=	Design flow
	Q <sub>s</sub>	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
	f	=	Decimal fraction of critical flow
	C <sub>s</sub>	=	Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C<sub>o</sub>.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

## 1) Ammonia as N:

Because of recent data quality questions (as described in Section 10 of the Fact Sheet), it is staff's best professional judgement that the existing ammonia limitations (monthly average limit of 1.3 mg/L and weekly average limit of 2.4 mg/L) be carried forward with this reissuance (Attachment 4c). The effluent limitations derived from previously established values remain protective of water quality.

## 2) Metals:

It is staff's best professional judgement that copper data submitted after September 2010 is suitable for effluent limit evaluation. The following data points were used to reevaluate copper limitations: 23.3 µg/L, 21 µg/L, 11.6 µg/L, and 10.3 µg/L.

The recalculated limitation is more stringent than what was previously determined during the 2005 reissuance. As such, a monthly average limit of 15 µg/L and weekly average limit of 15 µg/L are proposed with this reissuance. See Attachment 4a for WLA and derivation of the limits.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD<sub>5</sub>), total suspended solids (TSS), and pH limitations are proposed.

Dissolved Oxygen and BOD<sub>5</sub> limitations are based on stream modeling conducted in November 1988 (Attachment 5a) and are set to meet the water quality criteria for D.O. in the receiving stream. The 1988 model run was conducted to address the facility's request for an increase in flow from 0.08 MGD to 0.16 MGD. Limitations for Dissolved Oxygen and BOD<sub>5</sub> obtained from the 1988 model run replaced those from an earlier model run in June 1974 (Attachment 5b).

Since the facility has not requested an increase in flow and plant operations have not changed, it is staff's best professional judgement that it is not necessary to run the Regional Dissolved Oxygen Model to determine if revised limitations for BOD<sub>5</sub> and dissolved oxygen are warranted. As such, the Dissolved Oxygen and BOD<sub>5</sub> limitations obtained from the 1988 model run shall be carried forward with this reissuance.

It is staff's practice to equate the Total Suspended Solids limits with the BOD<sub>5</sub> limits. TSS limits are established to equal BOD<sub>5</sub> limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

*E. coli* limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e) Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay. Significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries.

Because the facility has not requested an increase in flow with this reissuance and there are no upgrades planned, it is staff's best professional judgement that continued nutrient monitoring is not necessary. As such, monitoring for Nitrates + Nitrites, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus shall be discontinued with this reissuance.

*The Watershed General VPDES Permit for Nutrient Discharges to the Chesapeake Bay* will be required for the Hamilton STP only when the existing facility expands. If the facility expands in the future, any load above the load from the 0.16 MGD plant will be have to be offset in accordance with the requirements set forth in the watershed General Permit.

f) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for BOD<sub>5</sub>, Total Suspended Solids, Ammonia, pH, Dissolved Oxygen, *E. coli*, and Total Recoverable Copper.

The limit for Total Suspended Solids is based on Best Professional Judgement.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/l), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

**18. Antibacksliding:**

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.



## VPDES PERMIT PROGRAM FACT SHEET

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PAGE 9 of 14**19. Effluent Limitations/Monitoring Requirements: Outfall 001**

Design flow is 0.16 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
		<u>Monthly Average</u>		<u>Weekly Average</u>		<u>Minimum</u>	<u>Maximum</u>	<u>Frequency</u>	<u>Sample Type</u>
Flow (MGD)	NA	NL		NA		NA	NL	Continuous	TIRE
pH	2	NA		NA		6.0 S.U.	9.0 S.U.	1/D	Grab
BOD <sub>5</sub>	2,3	20 mg/L	12 kg/day	30 mg/L	18 kg/day	NA	NA	3D/W	8H-C
Total Suspended Solids (TSS)	1	20 mg/L	12 kg/day	30 mg/L	18 kg/day	NA	NA	3D/W	8H-C
DO	2,3	NA		NA		6.0 mg/L	NA	1/D	Grab
Ammonia, as N	2	1.3 mg/L		2.4 mg/L		NA	NA	3D/W	8H-C
<i>E. coli</i> (Geometric Mean) <sup>a</sup>	2	126 n/100mls		NA		NA	NA	3D/W	Grab
Copper, Total Recoverable	2	15 µg/L		15 µg/L		NA	NA	1/M	Grab

The basis for the limitations codes are:

1. Best Professional Judgement

2. Water Quality Standards

3. Stream Model- Attachment 5a and 5b

*MGD* = Million gallons per day.*NA* = Not applicable.*NL* = No limit; monitor and report.*S.U.* = Standard units.*TIRE* = Totalizing, indicating and recording equipment.*1/D* = Once per day.*3D/W* = Three days per week.*1/M* = Once per month.

*8H-C* = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored eight-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of eight (8) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum eight (8) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by =10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

a. *E. coli* samples shall be collected three days per week between 10am and 4pm.

**20. Other Permit Requirements:**

- a) Part I.B. of the permit contains quantification levels and compliance reporting instructions.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

**21. Inflow and Infiltration (I&I):**

The Town of Hamilton's collection system receives excessive inflow and infiltration. The previous permit, reissued in November 2005, required the permittee to submit a plan and schedule for reducing inflow and infiltration to the treatment plant as well as mitigating the loss of solids from the treatment plant. Additionally the permittee was required to demonstrate by October 31, 2009, that they had achieved a measurable reduction (>10%) in inflow and infiltration.

An amended Special Order by Consent between DEQ and the Town of Hamilton became effective April 27, 2009. The Order required the Town of Hamilton to adhere to the Infiltration and Inflow Abatement Program submitted to DEQ on August 4, 2008, and approved on September 18, 2008. Additionally, the Order stated that "The dates included in the Infiltration and Inflow Abatement Scheduled outlined in Appendix A of the Infiltration and Inflow Abatement Program shall become an enforceable part of the Order and that any subsequent revisions to the Infiltration and Inflow Program shall be reviewed and approved by DEQ".

The Town of Hamilton shall continue to administer and fund a rehabilitation program to address the I&I problems in the Town's sanitary sewer collection system. An annual report shall be submitted to DEQ-NRO on or before August 30<sup>th</sup> of every year detailing the previous fiscal year's activities.

This report shall include, but is not limited to:

- The total funds allocated for the I & I program during the previous fiscal year;
- The fund's balance, if applicable;
- A summary of all studies/surveys conducted during the previous fiscal year;
- A summary of completed rehabilitation projects; and
- Projected/proposed course of actions for the upcoming fiscal year.

Future changes to the inflow and infiltration abatement program shall be addressed by the submittal of a revised inflow and infiltration abatement program plan within 90 days of the changes. Non-compliance with the inflow and infiltration abatement program shall be deemed a violation of the permit.

**22. Other Special Conditions :**

- a) 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.
- b) Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1. and B.2. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.
- c) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190.E. The permittee shall submit for approval a revised Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO) by December 21, 2011. Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.
- d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.
- e) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class III operator.
- f) Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.
- g) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.
- h) Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.
- i) Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2., and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage
- j) Nutrient Reopener. 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

- k) Infiltration and Inflow (I&I) Abatement Program. The Town of Hamilton shall continue to administer and fund a rehabilitation program to address the I&I problems in the Town's sanitary sewer collection system in accordance with the abatement program plan approved on September 18, 2008. Any changes to the plan must be submitted to the DEQ Northern Regional Office for review and approval at least 60 days prior to the change. Non-compliance with the I&I abatement program shall be deemed a violation of the permit.

An annual report shall be submitted to the DEQ Northern Regional Office on or before August 30<sup>th</sup> of every year detailing the previous fiscal year's activities. This report shall include, but is not limited to:

- The total funds allocated for the I & I program during the previous fiscal year;
- The fund's balance, if applicable;
- A summary of all studies/surveys conducted during the previous fiscal year;
- A summary of completed rehabilitation projects; and
- Projected/proposed course of actions for the upcoming fiscal year.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

## 23. Changes to the Permit from the Previously Issued Permit:

- a) Special Conditions:
1. The Inflow and Infiltration (I&I) special condition was revised in response to permittee compliance with the previous permit special condition requirements for submittal of a plan and schedule for reduction of I&I as well as a >10% reduction in I&I. The revised condition requires the Town to continue to administer and fund a rehabilitation program to address I&I as well as the submittal of an annual report.
  2. The Monthly Average Loading Nutrient Reporting Calculations special condition was removed from the permit with this reissuance as nutrient reporting is no longer required by the permit.
  3. The Annual Effluent Loading Nutrient Reporting Calculations special condition was removed from the permit with this reissuance as nutrient reporting is no longer required by the permit.
  4. A TMDL special condition was added to the permit with this reissuance.
- b) Monitoring and Effluent Limitations:
1. All nutrient monitoring and reporting requirements have been removed from the permit with this reissuance. If the STP expands, the facility shall be required to obtain coverage under *The Watershed General VPDES Permit for Nutrient Discharges to the Chesapeake Bay*.
  2. The Total Recoverable Copper limit has been revised from 19 µg/L to 15 µg/L.

## 24. Variances/Alternate Limits or Conditions: N/A

## 25. Public Notice Information:

First Public Notice Date: August 17, 2011

Second Public Notice Date: August 24, 2011

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3853, [susan.mackert@deq.virginia.gov](mailto:susan.mackert@deq.virginia.gov). See Attachment 6 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by

the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

**26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):**

The receiving stream, an unnamed tributary to South Fork Catoclin Creek, is not listed on the current 303(d) list. However, the 2010 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report (IR) gives an impaired classification for the following downstream segment VANA02R\_SOC01A00.

The South Fork Catoclin Creek TMDL for *E. coli* included the impairment at segment VANA02R\_SOC01A00. All upstream discharges were taken into account when developing the TMDL and as such, the facility received a WLA for *E. coli* of 2.78E+11 cfu/year. The *E. coli* TMDL was approved by EPA on May 31, 2002.

TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

**27. Additional Comments:****Previous Board Action(s):**

A Special Order by Consent between DEQ and the Town of Hamilton became effective March 17, 2006. This Order addressed permit and regulation violations including failing to submit a new application for a permit 180 days before expiration of the existing permit, operating a UV system without a Certificate to Operate, and exceeding permit limits for Total Copper.

An Amendment to Special Order by Consent between DEQ and the Town of Hamilton became effective April 27, 2009, and superseded the March 2006 Order. The amended Order continued to address permit limit violations as well as hydraulic overloading of the STP. As of the date of this reissuance, the amended Order is still in effect.

**Staff Comments:**

Permit processing was delayed due to potential problems with the integrity of effluent data reported on DMRs, sample collection, and operation and maintenance of the STP.

**Staff Comments:**

With this reissuance, VDH recommended a Reliability Class I for the facility. This recommendation was based on general public health protection concerns related to the presence of significant residential development immediately downstream of the discharge point and the potential for human contact.

At the suggestion of VDH, DEQ staff contacted the Loudoun County Health Department and the Town of Hamilton for their input and comments on the reliability class of the facility. As of the date of this reissuance, the Loudoun County Health Department has not responded to DEQ's inquiry on this matter. The Town of Hamilton has provided information on power redundancy for the STP and has stated that there is no evidence that overflows at the STP can be attributed to the current Reliability Class II of the facility. Additionally, the Town of Hamilton has expressed their objection to a reclassification and the associated financial burden to the Town to comply.

Because the facility has not requested an increase in flow with this reissuance and upgrades are not immediately planned, it is staff's best professional judgement that a change in reliability class is not warranted for the facility. As such, a Reliability Class II shall remain in the reissued permit.

**Public Comment:**

No comments were received during the public notice.

**EPA Checklist:**

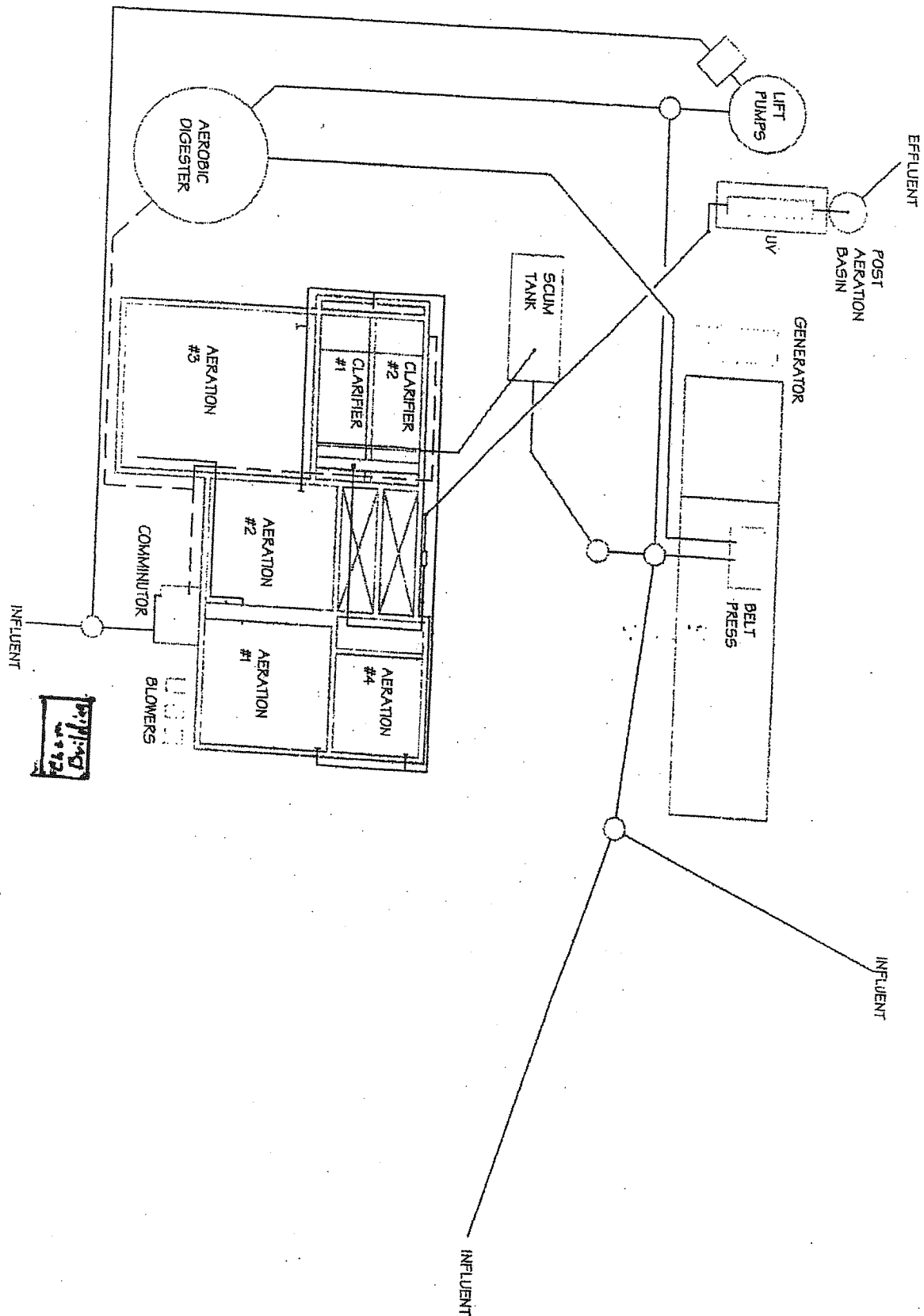
The checklist can be found in Attachment 7.

## Fact Sheet Attachments – Table of Contents

Hamilton STP  
VA0020974

2011 Reissuance

Attachment 1	Facility Diagram
Attachment 2	Topographic Map
Attachment 3	Site Visit Memorandum
Attachment 4a	Wasteload Allocation Analysis / Limit Derivation - 2011
Attachment 4b	Wasteload Allocation Analysis / Limit Derivation - 2005
Attachment 4c	Wasteload Allocation Analysis / Limit Derivation - 2000
Attachment 5a	Dissolved Oxygen Model - 1988
Attachment 5b	Dissolved Oxygen Model - 1974
Attachment 6	Public Notice
Attachment 7	EPA Checklist



LINE DRAWING

WASTEWATER TREATMENT PLANT - SIMPLIFIED PLAN



Sheet	M-1
Revised	
Checked	
Designed	
Drawn	

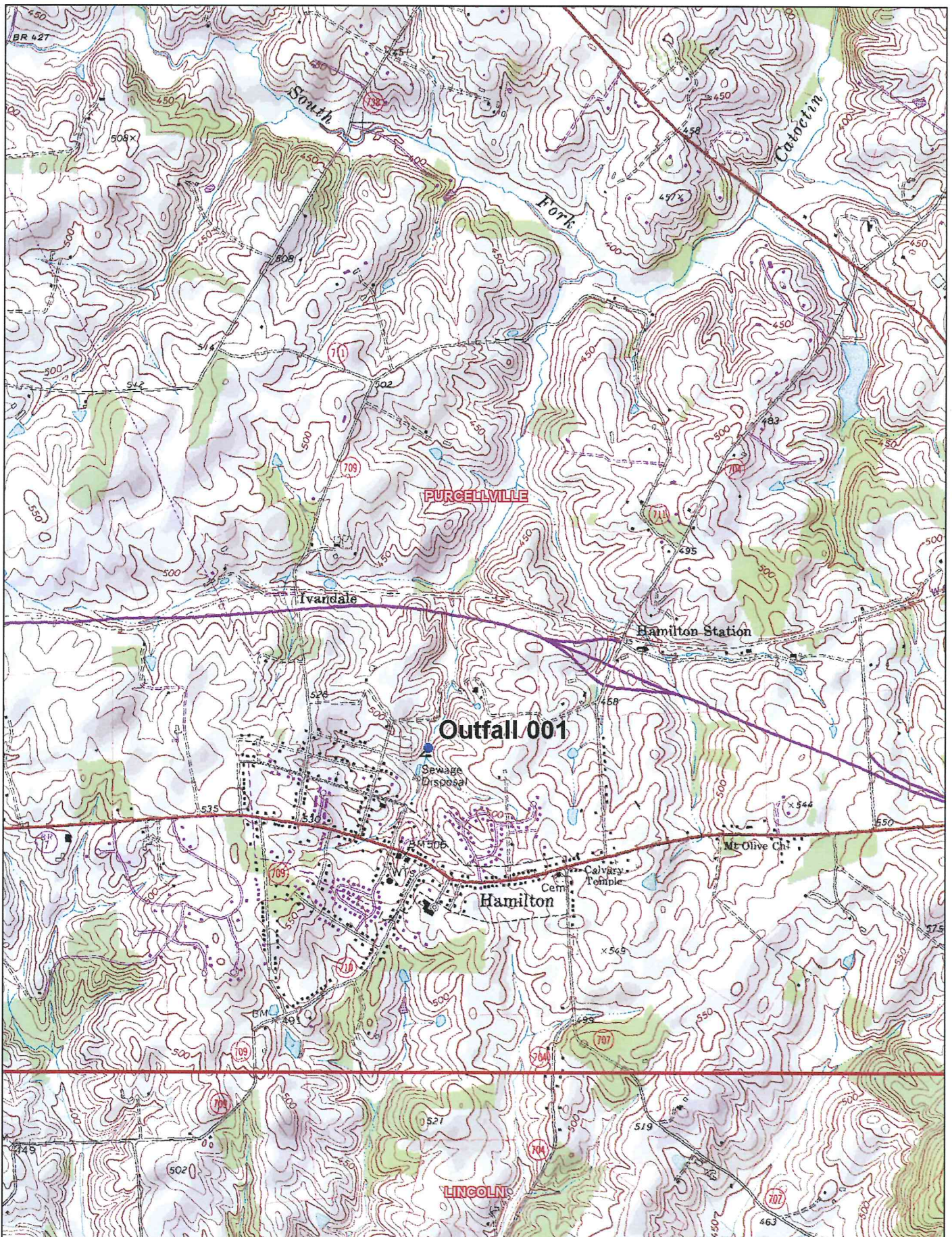


Waste Water Management, Inc.  
 3016 Williams Drive, Suite 11  
 Fairfax, Virginia 22031  
 (703) 846-0098

Town of Hamilton  
 P.O. Box 130  
 Hamilton, Virginia 20159  
 (540) 338-2811

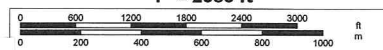
Town Of Hamilton  
 Wastewater  
 Treatment Plant





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www.delorme.com

Scale 1 : 25,000  
1" = 2080 ft





**MEMORANDUM**

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY**

**NORTHERN REGIONAL OFFICE**

13901 Crown Court

Woodbridge, VA 22193

SUBJECT: Reissuance Site Visit  
Hamilton STP (VA0020974)

TO: Permit Reissuance File

FROM: Susan Mackert

DATE: November 9, 2010

A site visit was performed on November 1, 2010, to verify information provided in the facility's permit reapplication package. Information provided in the reapplication package was found representative of actual site conditions.

The Hamilton STP is a municipal wastewater treatment plant with a current design capacity of 0.16 MGD. The facility treats domestic sewage from the Town of Hamilton. At the time of the site visit the facility was experiencing an overflow at the headworks of the plant (photos 1 - 3). Facility staff immediately addressed the overflow and reported, as required by the permit, to the Department. Facility staff estimated the overflow at approximately 50 – 100 gallons.

The STP is fed by three pump stations as well as gravity lines. Wastewater enters the headworks through a grit chamber and comminutor. Flow is then split between three aeration basins. Flow from the aeration basins is then routed to one of two secondary clarifiers which can each treat 0.08 MGD. Aeration basin number one directly enters one of two secondary clarifiers while aeration basin number two enters an additional aeration basin before entering secondary clarification.

After clarification, flow is then directed to the ultraviolet (UV) disinfection unit. The UV facility consists of four banks operated in series with each bank containing three lamps per bank. Flow then is directed to post aeration.

Solids from the secondary clarifiers are wasted to the aerobic digester. After digestion, the solids are dewatered through a belt press. The pressed solids are hauled to the Loudoun County Landfill for final disposal.

Final effluent is then discharged via Outfall 001 (photo 4) to an unnamed tributary to South Fork Catoctin Creek.



Photo 1. Overflow at headworks.



Photo 2. Overflow at headworks.



Photo 3. Overflow at headworks.



Photo 4. Outfall 001.

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Hamilton STP

Permit No.: VA0020974

Receiving Stream: UT, South Fork Catoclin Creek

Version: OWP Guidance Memo 00-2011 (8/24/00)

## Stream Information

Mean Hardness (as CaCO<sub>3</sub>) =  
90% Temperature (Annual) =  
90% Temperature (Wet season) =  
90% Maximum pH =  
10% Maximum pH =  
Tier Designation (1 or 2) =  
Public Water Supply (PWS) Y/N? =  
Trout Present Y/N? =  
Early Life Stages Present Y/N? =

## Stream Flows

1Q10 (Annual) =  
7Q10 (Annual) =  
3Q10 (Annual) =  
1Q10 (Wet season) =  
3Q10 (Wet season) =  
3Q05 =  
Harmonic Mean =

## Mixing Information

Annual - 1Q10 Mix =  
- 7Q10 Mix =  
- 3Q10 Mix =  
Wet Season - 1Q10 Mix =  
- 3Q10 Mix =

## Effluent Information

Mean Hardness (as CaCO<sub>3</sub>) =  
90% Temp (Annual) =  
90% Temp (Wet season) =  
90% Maximum pH =  
10% Maximum pH =  
Discharge Flow =

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acetophene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	--	--
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	--	--
Acrylonitrile <sup>c</sup>	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	--	--
Aldin <sup>c</sup>	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	4.20E+01	3.64E+00	na	--	4.2E+01	3.6E+00	na	--	--	--	--	--	--	--	--	--	4.2E+01	3.6E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	4.20E+01	3.64E+00	na	--	4.2E+01	3.6E+00	na	--	--	--	--	--	--	--	--	--	4.2E+01	3.6E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene <sup>c</sup>	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine <sup>c</sup>	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis(2-Chloroethyl) Ether <sup>c</sup>	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis(2-Chloroisopropyl) Ether <sup>c</sup>	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate <sup>c</sup>	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromofarm <sup>c</sup>	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	4.3E+00	1.2E+00	na	--	4.3E+00	1.2E+00	na	--	--	--	--	--	--	--	--	--	4.3E+00	1.2E+00	na	--
Carbon Tetrachloride <sup>c</sup>	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane <sup>c</sup>	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
THC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03

Parameter (μg/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorobromomethane <sup>c</sup>	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	na	1.3E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	na	--
Chromium III	0	6.1E+02	8.0E+01	na	--	6.1E+02	8.0E+01	na	--	--	--	--	--	--	--	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	na	--
Chrysene <sup>c</sup>	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	na	1.8E-02
Copper	0	1.5E+01	9.6E+00	na	--	1.5E+01	9.6E+00	na	--	--	--	--	--	--	--	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	na	1.6E+04
DDD <sup>c</sup>	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	na	3.1E-03
DDE <sup>c</sup>	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	na	2.2E-03
DDT <sup>c</sup>	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	na	2.2E-03
Demeton	0	--	1.0E-01	na	--	1.0E-01	--	na	--	--	--	--	--	--	--	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	na	--
Dibenz(a,h)anthracene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	na	1.8E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	na	1.3E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	na	9.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	na	1.9E+02
3,3-Dichlorobenzidine <sup>c</sup>	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	na	2.8E-01
Dichlorobromomethane <sup>c</sup>	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	na	1.7E+02
1,2-Dichloroethane <sup>c</sup>	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	na	3.7E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	na	7.1E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	na	1.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane <sup>c</sup>	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	na	1.5E+02
1,3-Dichloropropane <sup>c</sup>	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	na	2.1E+02
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	na	4.4E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	na	8.5E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	na	1.1E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	na	4.5E+03
2,4-Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	na	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	na	2.8E+02
2,4-Dinitrofluorene <sup>c</sup> Dioxin 2,3,7,8-	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	na	3.4E+01
tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	na	5.1E-08
1,2-Diphenylhydrazine <sup>c</sup>	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	na	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	na	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	na	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	na	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	na	8.9E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	na	6.0E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	na	3.0E-01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Hepachlor °	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	--	--	na	7.9E-04
Hepachlor Epoxide °	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	--	--	na	3.9E-04
Hexachlorobenzene °	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene °	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Alpha-BHC °	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Beta-BHC °	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	--	--	na	1.8E+00
Gamma-BHC ° (Lindane)	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachlorocyclopentadiene	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hexachloroethane °	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Hydrogen Sulfide	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Indeno (1,2,3-cd) pyrene °	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone °	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Lead	0	1.3E+02	1.5E+01	na	--	1.3E+02	1.5E+01	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride °	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nickel	0	2.0E+02	2.2E+01	na	4.6E+03	2.0E+02	2.2E+01	na	4.6E+03	--	--	--	--	--	--	--	--	--	--	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine °	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine °	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine °	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	--	--	na	--
PCB Total °	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	--	na	6.4E-04
Pentachlorophenol °	0	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter (µg/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	2.0E+01	5.0E+00	na	4.2E+03	--	--	na	--
Silver	0	4.0E+00	--	na	--	4.0E+00	--	na	--	--	--	--	--	4.0E+00	--	na	--	--	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--	--	--	na	--
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	na	4.0E+01	--	--	na	4.0E+01
Tetrachloroethylene <sup>c</sup>	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	na	3.3E+01	--	--	na	3.3E+01
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	na	4.7E-01	--	--	na	4.7E-01
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	na	6.0E+03	--	--	na	6.0E+03
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--	--	--	na	--
Toxaphene <sup>c</sup>	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	7.3E-01	2.0E-04	na	2.8E-03	--	--	na	2.8E-03
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	4.6E-01	7.2E-02	na	--	--	--	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	na	7.0E+01	--	--	na	7.0E+01
1,1,2-Trichloroethane <sup>c</sup>	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	na	1.6E+02	--	--	na	1.6E+02
Trichloroethylene <sup>c</sup>	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	na	3.0E+02	--	--	na	3.0E+02
2,4,6-Trichlorophenol <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	na	2.4E+01	--	--	na	2.4E+01
2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--	--	--	na	--
Vinyl Chloride <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	na	2.4E+01	--	--	na	2.4E+01
Zinc	0	1.3E+02	1.3E+02	na	2.6E+04	1.3E+02	1.3E+02	na	2.6E+04	--	--	--	--	1.3E+02	1.3E+02	na	2.6E+04	--	--	na	2.6E+04

Notes:

1. All concentrations expressed as micrograms/liter (µg/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipalities
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic  
= (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Armonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	7.3E-01
Chromium III	4.8E+01
Chromium VI	6.4E+00
Copper	5.8E+00
Iron	na
Lead	9.0E+00
Manganese	na
Mercury	4.6E-01
Nickel	1.3E+01
Selenium	3.0E+00
Silver	1.6E+00
Zinc	5.0E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance



3/24/2011 3:09:53 PM

Facility = Hamilton STP  
Chemical = Ammonia  
Chronic averaging period = 30  
WLAa = 42  
WLAc = 3.6  
Q.L. = 0.2  
# samples/mo. = 12  
# samples/wk. = 3

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average = 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 7.26361233629872  
Average Weekly limit = 5.31292348205901  
Average Monthly Limit = 3.95743357045276

The data are:

9



3/24/2011 3:14:26 PM

Facility = Hamilton STP  
Chemical = Copper  
Chronic averaging period = 30  
WLAa = 15  
WLAc = 9.6  
Q.L. = 2.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 4  
Expected Value = 16.55  
Variance = 98.6049  
C.V. = 0.6  
97th percentile daily values = 40.2730  
97th percentile 4 day average = 27.5357  
97th percentile 30 day average = 19.9601  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity  
Maximum Daily Limit = 15  
Average Weekly limit = 15  
Average Monthly Limit = 15

The data are:

23.3  
21  
11.6  
10.3

8/18/2005 8:21:07 AM

Facility = Hamilton STP  
Chemical = Ammonia as N  
Chronic averaging period = 30  
WLAa = 42  
WLAc = 3.6  
Q.L. = .2  
# samples/mo. = 12  
# samples/wk. = 3

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average = 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 7.26361233629872  
Average Weekly limit = 5.31292348205901  
Average Monthly Limit = 3.95743357045276

The data are:

9

Analysis of the Hamilton STP effluent data for Ammonia

The statistics for Ammonia are:

Number of values	=	1
Quantification level	=	.2
Number < quantification	=	0
Expected value	=	1.9
Variance	=	1.2996
C.V.	=	.6
97th percentile	=	4.623493
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	21.30559
Chronic WLA	=	1.650115
Human Health WLA	=	----

The limits are based on chronic toxicity and 12 samples/month.

Maximum daily limit	=	2.413417
Average monthly limit	=	1.314902

DATA

1.9

Analysis of the Town of Hamilton effluent data for Copper  
Averaging period for standard = 4 days

The statistics for Copper are:

Number of values	=	6
Quantification level	=	10
Number < quantification	=	0
Expected value	=	27.3
Variance	=	268.3044
C.V.	=	.6
97th percentile	=	66.4323
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Copper are:

Acute WLA	=	19.28
Chronic WLA	=	12.76
Human Health WLA	=	----

Limits are based on chronic toxicity and 1 samples/month, 1 samples/week

Maximum daily limit	=	18.66245
Average weekly limit	=	18.66245
Average monthly limit	=	18.66245

Note: The maximum daily limit applies to industrial dischargers  
The average weekly limit applies to POTWs  
The average monthly limit applies to both.

The Data are

23.9  
25.6  
25  
16.8  
35  
37.5

# AMMONIA CALCULATION ACUTE

Final Temperature = 23 °C pH = 6.8 S.U.

$$FT = 10^{0.03(20-TCAP)} ; TCAP < T < 30^{\circ} C$$

$$FT = 10^{0.03(20-T)} ; 0 < T < TCAP$$

TCAP = 20° C; When Trout and Other Sensitive Coldwater Species Are Present

TCAP = 25° C; When Trout and Other Sensitive Coldwater Species Are Absent

$$FT = 10^{0.03(20-23)}$$

$$FT = .81283$$

$$FPH = 1 ; 8.0 < pH < 9.0$$

$$FPH = (1 + 10^{7.4 - pH})/1.25 ; 6.5 < pH < 8.0$$

$$FPH = (1 + 10^{7.4 - 6.8})/1.25$$

$$FPH = 3.9848$$

$$ACUTE CRITERIA CONCENTRATION = .52/FT/FPH/2 = .52/.81283 / 3.9848 / 2 = .080272557$$

Conversion from un-ionized to Total Ammonia can be calculated by using the following formulas:

Total Acute Ammonia Criteria = Calculated un-ionized ammonia criteria divided by fraction of un-ionized Ammonia

Where: Fraction of un-ionized ammonia =  $1/(10^{pKa-pH} + 1)$

where:  $pKa = 0.09018 + (2729.92/(273.2 + \text{temperature } ^{\circ}C, 23))$   
 $pKa = 9.306655354$

$$\text{Fraction of un-ionized ammonia} = 1/(10^{9.306655354 - 6.8} + 1)$$

$$= .003104519$$

Therefore: Total Acute Ammonia Criteria = Calculated un-ionized Ammonia Criteria divided by fraction of un-ionized Ammonia

$$\text{Total Acute Ammonia Criteria} = .08027135/.003104519 = 25.85629497 \text{ mg/l}$$

Total Ammonia is then converted to Ammonia-Nitrogen.

$$\text{TOTAL ACUTE N-NH}_3: 25.85629497 \times 0.824 = 21.30558705 \text{ MG/L}$$

# AMMONIA CALCULATION CHRONIC

Final Temperature = 23 °C pH = 6.8 S.U.

$$FT = 10^{0.03(20-TCAP)} ; TCAP < T < 30^{\circ} C$$

$$FT = 10^{0.03(20-T)} ; 0 < T < TCAP$$

TCAP = 15° C; When Trout and Other Sensitive Coldwater Species Are Present

TCAP = 20° C; When Trout and Other Sensitive Coldwater Species Are Absent

$$FT = 10^{0.03(20-20)}$$

$$FT = 1.$$

$$FPH = 1 ; 8.0 < pH < 9.0$$

$$FPH = (1 + 10^{7.4 - pH})/1.25 ; 6.5 < pH < 8.0$$

$$FPH = (1 + 10^{7.4 - 6.8})/1.25$$

$$FPH = 3.9848$$

$$\text{Ratio} = 13.5 ; 7.7 < pH < 9$$

$$\text{Ratio} = 20.25 \times (10^{7.7 - pH}) / (1 + 10^{7.4 - pH}) ; 6.5 < pH < 7.7$$

$$\text{Ratio} = 20.25 \times (10^{7.7 - 6.8}) / (1 + 10^{7.4 - 6.8})$$

$$\text{Ratio} = 7.943282347/4.981071706 = 32.29254205$$

$$\text{CHRONIC CRITERIA CONCENTRATION} = .8/FT/FPH/RATIO = .8/1/3.9848/32.29254205 = .006217005$$

Conversion from un-ionized to Total Ammonia can be calculated by using the following formulas:

Total Chronic Ammonia Criteria = Calculated un-ionized ammonia criteria divided by fraction of un-ionized Ammonia

Where: Fraction of un-ionized ammonia =  $1/(10^{pKa-pH} + 1)$

where:  $pKa = 0.09018 + (2729.92/(273.2 + \text{temperature } ^{\circ}C, 23))$   
 $pKa = 9.306655354$

$$\text{Fraction of un-ionized ammonia} = 1/(10^{9.306655354 - 6.8} + 1) = .003104519$$

Therefore: Total Chronic Ammonia Criteria = Calculated un-ionized Ammonia Criteria divided by fraction of un-ionized Ammonia

$$\text{Total Chronic Ammonia Criteria} = .0080272557/.003104519 = 2.002566295 \text{ mg/l}$$

Total Ammonia is then converted to Ammonia-Nitrogen.

$$\text{TOTAL CHRONIC N-NH}_3: 2.002566295 \times 0.824 = 1.650114627 \text{ MG/L}$$

# HAMILTON STP EFFLUENT AMMONIA DATA

Dec 1993 - Jan 1995 RANK AND PERCENTILE

DATUM	Point	Sample	Rank	Percent	DATUM	Point	Sample	Rank	Percent	DATUM	Point	Sample	Rank	Percent
0.1	128	3.5	1	100.00%	0.11	108	0.15	83	55.62%	0.15	2	0.025	141	0.62%
0.025	137	3	2	99.38%	0.22	141	0.15	83	55.62%	0.05	4	0.025	141	0.62%
0.05	38	2	3	98.12%	0.2	21	0.125	73	53.75%	0.05	8	0.025	141	0.62%
0.025	129	2	3	98.12%	0.275	75	0.125	73	53.75%	0.025	13	0.025	141	0.62%
0.05	148	1.8	5	87.50%	0.125	148	0.125	73	53.75%	0.025	16	0.025	141	0.62%
0.15	140	1.8	6	96.25%	0.1	71	0.11	78	53.12%	0.1	23	0.025	141	0.62%
0.075	155	1.8	6	96.25%	0.15	1	0.1	77	48.88%	0.375	37	0.025	141	0.62%
0.025	152	1.5	8	95.62%	0.1	48	0.1	77	48.88%	0.125	68	0.025	141	0.62%
0.075	32	1.3	9	95.00%	0.075	87	0.1	77	48.88%	1.9	82	0.025	141	0.62%
1	151	1.2	10	94.38%	0.075	78	0.1	77	48.88%	1	84	0.025	141	0.62%
0.05	30	1.1	11	93.75%	0.15	78	0.1	77	48.88%	1.2	95	0.025	141	0.62%
0.05	10	1	12	91.25%	0.025	105	0.1	77	48.88%	1.5	101	0.025	141	0.62%
0.025	25	1	12	91.25%	0.02	107	0.1	77	48.88%	0.35	103	0.025	141	0.62%
0.05	26	1	12	91.25%	0.025	117	0.1	77	48.88%	0.9	112	0.025	141	0.62%
0.3	150	1	12	91.25%	0.05	124	0.1	77	48.88%	1.8	133	0.025	141	0.62%
0.025	154	0.9	16	90.00%	0.075	148	0.1	77	48.88%	0.75	144	0.025	141	0.62%
0.075	157	0.9	16	90.00%	0.075	108	0.08	87	45.62%	0.9	145	0.025	141	0.62%
0.05	31	0.85	18	88.38%	0.075	121	0.08	87	45.62%	0.05	159	0.025	141	0.62%
0.075	156	0.75	19	88.75%	0.05	7	0.075	89	35.00%	0.025	160	0.025	141	0.62%
0.05	63	0.7	20	88.12%	0.15	9	0.075	89	35.00%	0.025	161	0.025	141	0.62%
0.125	81	0.65	21	86.88%	0.05	17	0.075	89	35.00%	0.025	83	0.02	161	0.00%
0.175	122	0.65	21	86.88%	0.05	19	0.075	89	35.00%					
0.025	24	0.55	23	85.00%	0.05	50	0.075	89	35.00%					
0.55	42	0.55	23	85.00%	0.05	79	0.075	89	35.00%					
1	57	0.55	23	85.00%	0.025	80	0.075	89	35.00%					
1	35	0.5	26	84.38%	0.075	88	0.075	89	35.00%					
0.15	53	0.45	27	83.75%	0.05	87	0.075	89	35.00%					
0.05	78	0.425	28	83.12%	0.05	88	0.075	89	35.00%					
0.35	40	0.4	29	81.88%	0.075	98	0.075	89	35.00%					
1.1	52	0.4	29	81.88%	0.15	99	0.075	89	35.00%					
0.88	58	0.375	31	80.00%	0.025	104	0.075	89	35.00%					
1.1	125	0.375	31	80.00%	0.05	108	0.075	89	35.00%					
0.3	147	0.375	31	80.00%	0.025	116	0.075	89	35.00%					
0.275	29	0.35	34	78.88%	0.075	118	0.075	89	35.00%					
0.5	51	0.35	34	78.88%	0.1	138	0.075	89	35.00%					
0.3	54	0.35	34	78.88%	0.05	3	0.05	108	13.75%					
0.025	58	0.35	34	78.88%	0.1	5	0.05	108	13.75%					
0.05	153	0.35	34	78.88%	0.08	11	0.05	108	13.75%					
2	15	0.3	39	71.88%	0.075	12	0.05	108	13.75%					
0.4	33	0.3	39	71.88%	0.22	14	0.05	108	13.75%					
0.05	38	0.3	39	71.88%	0.05	18	0.05	108	13.75%					
0.55	47	0.3	39	71.88%	0.025	20	0.05	108	13.75%					
0.2	82	0.3	39	71.88%	0.3	28	0.05	108	13.75%					
0.2	84	0.3	39	71.88%	0.05	38	0.05	108	13.75%					
0.15	113	0.3	39	71.88%	0.05	41	0.05	108	13.75%					
0.15	138	0.3	39	71.88%	0.075	85	0.05	108	13.75%					
0.3	34	0.275	47	70.62%	0.1	89	0.05	108	13.75%					
0.25	74	0.275	47	70.62%	0.05	91	0.05	108	13.75%					
0.1	48	0.25	49	68.75%	0.075	92	0.05	108	13.75%					
0.075	60	0.25	49	68.75%	0.05	93	0.05	108	13.75%					
0.35	130	0.25	49	68.75%	0.08	94	0.05	108	13.75%					
0.4	85	0.225	52	67.50%	0.85	97	0.05	108	13.75%					
0.45	125	0.225	52	67.50%	0.375	98	0.05	108	13.75%					
0.35	72	0.22	54	66.25%	0.1	108	0.05	108	13.75%					
0.35	110	0.22	54	66.25%	0.225	111	0.05	108	13.75%					
0.2	59	0.21	56	65.62%	0.05	114	0.05	108	13.75%					
0.55	43	0.2	57	62.50%	0.05	115	0.05	108	13.75%					
0.375	44	0.2	57	62.50%	3.5	118	0.05	108	13.75%					
0.21	58	0.2	57	62.50%	2	120	0.05	108	13.75%					
0.25	66	0.2	57	62.50%	0.25	126	0.05	108	13.75%					
0.85	73	0.2	57	62.50%	0.05	127	0.05	108	13.75%					
0.3	22	0.175	82	61.88%	0.05	131	0.05	108	13.75%					
0.7	8	0.15	83	55.62%	0.025	132	0.05	108	13.75%					
0.3	27	0.15	83	55.62%	0.05	134	0.05	108	13.75%					
0.225	45	0.15	83	55.62%	0.05	135	0.05	108	13.75%					
0.2	48	0.15	83	55.62%	0.075	138	0.05	108	13.75%					
0.1	68	0.15	83	55.62%	3	142	0.05	108	13.75%					
0.025	77	0.15	83	55.62%	0.3	143	0.05	108	13.75%					
0.15	81	0.15	83	55.62%	0.05	158	0.05	108	13.75%					
0.425	90	0.15	83	55.62%	1.8	102	0.03	140	13.12%					

## Hamilton STP

VA0020974

## Outfall 001 - DMR data

Month/Year	Flow (avg)	DO (mg/L)	TSS (mg/L)	BOD (mg/L)	Ammonia as N (mg/L)	Total Rec Copper (ug/L)*
Permit Limit	0.16	6.0 -conc min	20-conc avg	20-conc avg	1.3-conc avg	
Jan-03	0.124	8.1	7.7	4.9	0.8	21
Feb-03	0.091	8	7.7	5.2	0.8	
Mar-03	0.188	8	8.2	5	0.8	
Apr-03	0.12	8.1	8.5	5.3	0.8	no data reported
May-03	0.132	8	8.2	5	0.8	
Jun-03	0.167	8.2	8.3	5	0.8	
Jul-03	0.097	8.4	8.4	4.9	0.9	6.56
Aug-03	0.072	8.4	7.4	5.7	0.8	
Sep-03	0.134	8.1	7.4	5.5	0.8	
Oct-03	0.092	8.4	7.7	4.7	0.9	19.5
Nov-03	0.129	8.2	7.9	5.1	1	
Dec-03	0.139	8.5	7.2	5.7	1	
Jan-04	0.077	8	7.8	5.6	1	19.1
Feb-04	0.109	8	7.5	5.2	1	
Mar-04	0.082	8.2	8	5.1	0.9	
Apr-04	0.126	8.1	7.9	6.1	0.9	30.1
May-04	0.094	8.3	6.8	6	1	
Jun-04	0.082	8	8	6.2	1.1	
Jul-04	0.068	8.1	8.9	6.4	1	21.1
Aug-04	0.062	8	7.2	5.1	0.9	
Sep-04	0.104	8	7.3	4.3	0.7	
Oct-04	0.067	8.2	7.8	4.3	0.8	50.8
Nov-04	0.08	8	7.7	5.2	0.8	
Dec-04	0.099	8	7.6	5.5	0.8	
Jan-05	0.095	8	8.2	5	0.9	49.7
Feb-05	0.087	8.1	8.1	5	0.8	26.1
Mar-05	0.125	8.1	8	5.5	0.8	54.5
Apr-05	0.102	8.1	8.5	5.2	0.9	31.1
May-05	0.088	8.1	7.9	5.2	0.9	60
Jun-05	0.087	8	7.7	5.2	0.9	37.4
Average	0.091	8.1	7.8	5.3	0.9	

\*Revised DMR sent 12/30 with final TR Cu limits  
limit is 18.6 for TR Cu



MEMORANDUM

VIRGINIA STATE WATER CONTROL BOARD  
Office of Water Resources Management  
P.O. Box 11143

2111 N. Hamilton Street Richmond, Virginia 23230

Subject: Stream Analysis - Town of Hamilton (Loudoun Co)  
To: C. A. Sale - NRO  
From: Martin G. Ferguson, Jr. *Martin G. Ferguson, Jr.*  
Date: November 23, 1988  
Copies: B. R. Tuxford

We have reviewed the stream analysis for the proposed increase of the Town of Hamilton's discharge to the tributary of the South Fork of Catoctin Creek dated 11/18/88.

The modeling is acceptable and the model is approved for application. We have no problem with the permit limits proposed.

Please note that this model has not been checked for conformance with applicable areawide or 303(e) basinwide water quality management plans. This model must be in conformance with such plans, and it is the Regional Office's responsibility to insure such conformance.

RECEIVED  
DEC 1 1988

BY  
NORTHERN REGIONAL  
OFFICE

MEMORANDUM

VIRGINIA WATER CONTROL BOARD  
NORTHERN REGIONAL OFFICE

5515 Cherokee Avenue, Suite 404

Alexandria, Virginia 22312

SUBJECT: Loudoun County; ~~Town of Hamilton~~ STP Request to Increase Flow  
From 0.08 mgd to 0.16 mgd

TO: Martin Ferguson, OWRM

FROM: John Hopkins, NRO

DATE: November 18, 1988

COPIES: File

Please find attached a stream analysis for OWRM review and comment.

We have received a request from the Town of Hamilton to increase the flow of their facility from 0.08 mgd to 0.16 mgd.

The existing facility is an activated sludge process (design flow of 0.08 mgd) followed by a polishing pond. The plant was upgraded to this status in 1975. Discharge limits were determined by a stream model dated June 11, 1974. A copy of that model is enclosed for reference.

The plant discharges to an unnamed dry ditch which is tributary to the South Fork of Catoctin Creek, Potomac River Basin, Potomac River Subbasin, Section 10b, Class III, Special Standards: SR-2. A map is attached and it includes parts of the Purcellville topo and Waterford topo.

The 1974 model consisted of the following elements:

- (1) a dry ditch receiving stream (Segment 1)
- (2) a discharge from the Town of Hamilton STP to Segment 1
- (3) the background variables of the South Fork of Catoctin Creek (Segment 2)
- (4) the mass balance of Segments 1 & 2.

I was able to duplicate the old model (from 1974) using Version 3.03 (March 1988) of the SWCB stream model floppy disk program. A copy of that duplication is attached in the form of two (2) model runs. The first model run was made at "0" feet elevation and matches the results of the model of 1974. The second model run was made at actual elevation of the stp and receiving stream and matches the previous results as well. The third run is an allocation run for the proposed flow increase to 0.16 mgd. The only difference in variables between the calibration run at elevation and the allocation run is the flow of the discharge.

Results of the allocation run indicate appropriate proposed discharge limits at a flow of 0.16 mgd to be: BOD<sub>5</sub> and TSS of 20 mg/l, DO of 6.0 mg/l and no TKN limit.

MODEL SIMULATION FOR THE TOWN OF ( ) TP DISCHARGE TO  
UNNAMED TRIBUTARY OF S. FORK OF CATO CREEK

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 1.60 MI VELOCITY = 9.818 MI/D  
TEMP. = 30.0 °C ELEV = 0.00 FT SATURATION D.O. = 7.720 MG/L  
k<sub>a</sub> = 1.000 /DAY k<sub>r</sub> = 0.200 /DAY k<sub>n</sub> = 0.000 /DAY

CALIBRATION Run  
AT "0" ELEVATION

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0800 MGD D.O.= 6.000 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.000	31.200	0.000
0.100	0.100	5.922	31.100	0.000
0.200	0.200	5.846	30.999	0.000
0.300	0.300	5.771	30.900	0.000
0.400	0.400	5.697	30.800	0.000
0.500	0.500	5.624	30.701	0.000
0.600	0.600	5.553	30.602	0.000
0.700	0.700	5.483	30.504	0.000
0.800	0.800	5.414	30.405	0.000
0.900	0.900	5.346	30.308	0.000
1.000	1.000	5.280	30.210	0.000
1.100	1.100	5.215	30.113	0.000
1.200	1.200	5.150	30.016	0.000
1.300	1.300	5.087	29.919	0.000
1.400	1.400	5.025	29.823	0.000
1.500	1.500	4.965	29.727	0.000

\*\*\*\*\*  
 THE VARIABLES FOR SECTION 2 ARE:  
 -----

SEGMENT LENGTH = 1.50 MI VELOCITY = 9.818 MI/D  
 TEMP. = 30.0 °C ELEV = 0.00 FT SATURATION D.O. = 7.720 MG/L  
 Ka = 2.000 /DAY Kr = 0.180 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:  
 -----

FLOW= 0.0627 MGD D.O.= 6.08 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L  
 .....

THE RESULTS FOR SECTION 2 ARE:  
 -----

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
-----	-----	-----	-----	-----
0.000	1.600	5.423	17.930	0.000
0.100	1.700	5.430	17.878	0.000
0.200	1.800	5.437	17.826	0.000
0.300	1.900	5.444	17.774	0.000
0.400	2.000	5.452	17.723	0.000
0.500	2.100	5.459	17.672	0.000
0.600	2.200	5.466	17.620	0.000
0.700	2.300	5.473	17.569	0.000
0.800	2.400	5.480	17.518	0.000
0.900	2.500	5.487	17.468	0.000
1.000	2.600	5.494	17.417	0.000
1.100	2.700	5.501	17.367	0.000
1.200	2.800	5.508	17.316	0.000
1.300	2.900	5.514	17.266	0.000
1.400	3.000	5.521	17.216	0.000
1.500	3.100	5.528	17.166	0.000

# THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

## THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 1.60 MI VELOCITY = 9.818 MI/D  
 TEMP. = 30.0 °C ELEV = 460.00 FT SATURATION D.O. = 7.596 MG/L  
 Ka = 1.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

## FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0800 MGD D.O.= 6.00 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

## THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.000	31.200	0.000
0.100	0.100	5.921	31.100	0.000
0.200	0.200	5.843	30.999	0.000
0.300	0.300	5.766	30.900	0.000
0.400	0.400	5.691	30.800	0.000
0.500	0.500	5.617	30.701	0.000
0.600	0.600	5.544	30.602	0.000
0.700	0.700	5.472	30.504	0.000
0.800	0.800	5.402	30.405	0.000
0.900	0.900	5.333	30.308	0.000
1.000	1.000	5.265	30.210	0.000
1.100	1.100	5.198	30.113	0.000
1.200	1.200	5.133	30.016	0.000
1.300	1.300	5.068	29.919	0.000
1.400	1.400	5.005	29.823	0.000
1.500	1.500	4.943	29.727	0.000

CALIBRATED RUN  
AT ELBURN

\*\*\*\*\*  
 THE VARIABLES FOR SECTION 2 ARE:  
 -----

SEGMENT LENGTH = 1.50 MI VELOCITY = 9.810 MI/D  
 TEMP. = 30.0 °C ELEV = 390.00 FT SATURATION D.O. = 7.615 MG/L  
 $k_a$  = 2.000 /DAY  $k_r$  = 0.100 /DAY  $k_n$  = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:  
 -----

FLOW = 0.0627 MGD D.O. = 6.00 MG/L CBODu = 3.00 MG/L NBODu = 0.00 MG/L  
 .....

THE RESULTS FOR SECTION 2 ARE:  
 -----

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
-----	-----	-----	-----	-----
0.000	1.600	5.373	17.930	0.000
0.100	1.700	5.379	17.878	0.000
0.200	1.800	5.385	17.826	0.000
0.300	1.900	5.391	17.774	0.000
0.400	2.000	5.397	17.723	0.000
0.500	2.100	5.402	17.672	0.000
0.600	2.200	5.408	17.620	0.000
0.700	2.300	5.414	17.569	0.000
0.800	2.400	5.420	17.518	0.000
0.900	2.500	5.426	17.468	0.000
1.000	2.600	5.432	17.417	0.000
1.100	2.700	5.437	17.367	0.000
1.200	2.800	5.443	17.316	0.000
1.300	2.900	5.449	17.266	0.000
1.400	3.000	5.455	17.216	0.000
1.500	3.100	5.461	17.166	0.000

## THE BACKGROUND CONDITIONS ARE:

\* FLOW = 0.0000 MGD D.O. = 0.000 MG/L CBOD<sub>u</sub> = 0.00 MG/L NBOD<sub>u</sub> = 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

\*\*\*\*\*  
THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 1.60 MI VELOCITY = 9.818 MI/D  
TEMP. = 30.0 °C ELEV = 460.00 FT SATURATION D.O. = 7.596 MG/L  
Ka = 1.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

## FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW = 0.1600 MGD D.O. = 6.00 MG/L CBOD<sub>u</sub> = 26.00 MG/L NBOD<sub>u</sub> = 0.00 MG/L  
.....

ALLOCATION RUN

## THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBOD <sub>u</sub> (mg/l)	NBOD <sub>u</sub> (mg/l)
0.000	0.000	6.000	26.000	0.000
0.100	0.100	5.937	25.916	0.000
0.200	0.200	5.876	25.833	0.000
0.300	0.300	5.815	25.750	0.000
0.400	0.400	5.756	25.667	0.000
0.500	0.500	5.697	25.584	0.000
0.600	0.600	5.640	25.502	0.000
0.700	0.700	5.583	25.420	0.000
0.800	0.800	5.528	25.338	0.000
0.900	0.900	5.473	25.256	0.000
1.000	1.000	5.420	25.175	0.000
1.100	1.100	5.367	25.094	0.000
1.200	1.200	5.315	25.013	0.000
1.300	1.300	5.265	24.933	0.000
1.400	1.400	5.215	24.852	0.000
1.500	1.500	5.166	24.772	0.000

\*\*\*\*\*  
 THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 1.50 MI VELOCITY = 9.818 MI/D  
 TEMP. = 30.0 °C ELEV = 390.00 FT SATURATION D.O. = 7.615 MG/L  
 Ka = 2.000 /DAY Kr = 0.180 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0627 MGD D.O.= 6.00 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L  
 .....

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	1.600	5.366	18.505	0.000
0.100	1.700	5.370	18.531	0.000
0.200	1.800	5.375	18.478	0.000
0.300	1.900	5.379	18.424	0.000
0.400	2.000	5.383	18.371	0.000
0.500	2.100	5.387	18.317	0.000
0.600	2.200	5.392	18.264	0.000
0.700	2.300	5.396	18.211	0.000
0.800	2.400	5.401	18.159	0.000
0.900	2.500	5.405	18.106	0.000
1.000	2.600	5.410	18.054	0.000
1.100	2.700	5.414	18.001	0.000
1.200	2.800	5.419	17.949	0.000
1.300	2.900	5.423	17.897	0.000
1.400	3.000	5.428	17.845	0.000
1.500	3.100	5.433	17.793	0.000



# MEMORANDUM

2111 North Hamilton Street

## State Water Control Board

P.O. Box 11143

Richmond, VA. 23230

SUBJECT: Loudoun County - Hamilton STP

TO: Al Pollock (BAT)

FROM: Gary N. Moore and John T. Hopkins

DATE: June 11, 1974

COPIES: George Whitaker (BAT)

X from POD to South Fork Catoctin Creek = 1.6 mi.

D.A. above confluence of unnamed tributary and S. Fork Catoctin Creek = 13.9 sq.mi.

Critical discharge = .007 cfs/sq mi (Goose Creek near Leesburg)

Critical flow at confluence of tributary and S. Fork Catoctin Creek =

$$\frac{13.9 \times .007}{1.55} = .0627 \text{ mgd}$$

$$\text{Slope of land} = \frac{460 - 390}{8448} = \frac{70}{8448} = .0082 \text{ ft/ft}$$

Assume velocity in receiving stream of .6 ft/sec

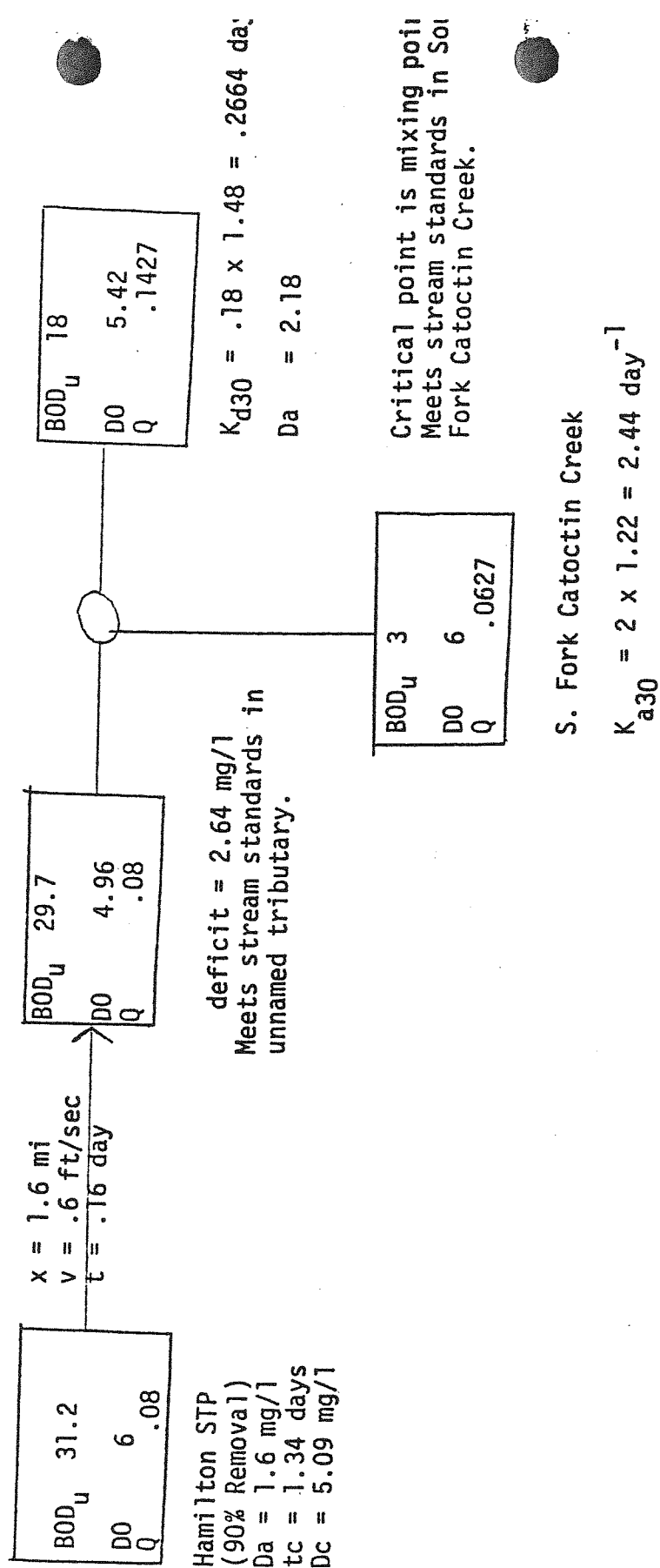
$$K_{d30} = .2 \times 1.48 = .296 \text{ day}^{-1} \text{ (based on effluent BOD of 24 mg/l)}$$

$$K_{a30} = 1 \times 1.22 = 1.22 \text{ day}^{-1}$$

Quads used: Purcellville, Round Hill

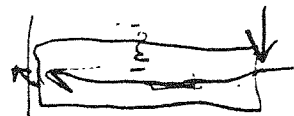
GNM/by

TOWN OF HAMILTON STP - SAA - 6/10/74



STATE WATER CONTROL BOARD  
NRO

SUBJECT: CHLORINE MASS BALANCE: Town of Hamilton/  
Loudoun County,  
TO: PERMIT FILE  
FROM: LC  
DATE: December 9, 1986  
COPIES:



The effluent is discharged to X-trub. South Fork Catawba R.  
The Q7-10 for this stream is 0 MGD. The wastewater  
treatment plant design flow is 0.10 MGD.

\*The allowable  $Cl_2$  discharge value

$$= \frac{(0.10 + .0627)}{(0.10)} (0.011 \text{ mg/l})$$

$$= 0.018 \text{ mg/l}$$

ADDITIONAL  
INFORMATION

Q7-10 value of 0 MGD in X-trub is assumed from  
June 11, 1974 stream analysis, and indicated in  
Dewberry + Davis calculations (8/20/86) in T. of Hamilton  
treatment plant study, Aug. 25, 1986, Q7-10 in S.F.C. = .0627 MGD  
Velocity = .6 ft/sec in dry ditch from discharge.  
 $L = 1.6 \text{ mi}$

Time = 1.163 days

Decay:  $.018 = C_0 e^{-(1)(1.163)}$   
 $.018 = C_0 (.8496)$   
 $.021 = C_0$   
mg/l

0.021 (A) Alternative disinfection or dechlorination to  
mg/l must be provided.

B. No dechlorination is required.

\* Use decay calculation if the discharge is to a dry ditch.

Public Notice – Environmental Permit

**PURPOSE OF NOTICE:** To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Loudoun County, Virginia.

**PUBLIC COMMENT PERIOD:** August 18, 2011 to 5:00 p.m. on September 16, 2011

**PERMIT NAME:** Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

**APPLICANT NAME, ADDRESS AND PERMIT NUMBER:** Town of Hamilton, 53 East Colonial Highway, Hamilton, VA 20159, VA0020974

**NAME AND ADDRESS OF FACILITY:** Hamilton STP, 104 North Rogers Street, Hamilton, VA 20159

**PROJECT DESCRIPTION:** The Town of Hamilton has applied for a reissuance of a permit for the public Hamilton STP. The applicant proposes to release treated sewage wastewaters from residential areas at a rate of 0.16 million gallons per day into a water body. The dewatered sludge will be transported to the Loudoun County Landfill for final disposal. The facility proposes to release the treated sewage into an unnamed tributary to South Fork Catoctin Creek in Loudoun County in the Potomac River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Dissolved Oxygen, BOD, Total Suspended Solids, Ammonia, Total Recoverable Copper, and *E. coli*.

**HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING:** DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

**CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION:** The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Susan Mackert

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3853 E-mail: [susan.mackert@deq.virginia.gov](mailto:susan.mackert@deq.virginia.gov) Fax: (703) 583-3821

**State "Transmittal Checklist" to Assist in Targeting  
Municipal and Industrial Individual NPDES Draft Permits for Review**

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Hamilton STP
NPDES Permit Number:	VA0020974
Permit Writer Name:	Susan Mackert
Date:	February 18, 2011

Major [ ]

Minor [X]

Industrial [ ]

Municipal [X]

**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

**I.B. Permit/Facility Characteristics**

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet <b>or</b> permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit? (See Section 10 of the Fact Sheet)		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet <b>or</b> permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		

**I.B. Permit/Facility Characteristics – cont.**

	Yes	No	N/A
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

## Part II. NPDES Draft Permit Checklist

### Region III NPDES Permit Quality Checklist – for POTWs

#### II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

#### II.B. Effluent Limits – General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?			X

#### II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

#### II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		X	
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	X		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	X		

<b>II.D. Water Quality-Based Effluent Limits – cont.</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	X		

<b>II.E. Monitoring and Reporting Requirements</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

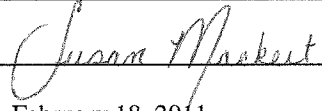
<b>II.F. Special Conditions</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?		X	
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the “Nine Minimum Controls”?			X
b. Does the permit require development and implementation of a “Long Term Control Plan”?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?			X

II.G. Standard Conditions		Yes	No	N/A
1. Does the <b>permit</b> contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?		X		
<b>List of Standard Conditions – 40 CFR 122.41</b>				
Duty to comply	Property rights	Reporting Requirements		
Duty to reapply	Duty to provide information	Planned change		
Need to halt or reduce activity	Inspections and entry	Anticipated noncompliance		
not a defense	Monitoring and records	Transfers		
Duty to mitigate	Signatory requirement	Monitoring reports		
Proper O & M	Bypass	Compliance schedules		
Permit actions	Upset	24-Hour reporting		
		Other non-compliance		
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?		X		



### Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Susan Mackert</u>
Title	<u>Environmental Specialist II Senior</u>
Signature	<u></u>
Date	<u>February 18, 2011</u>